



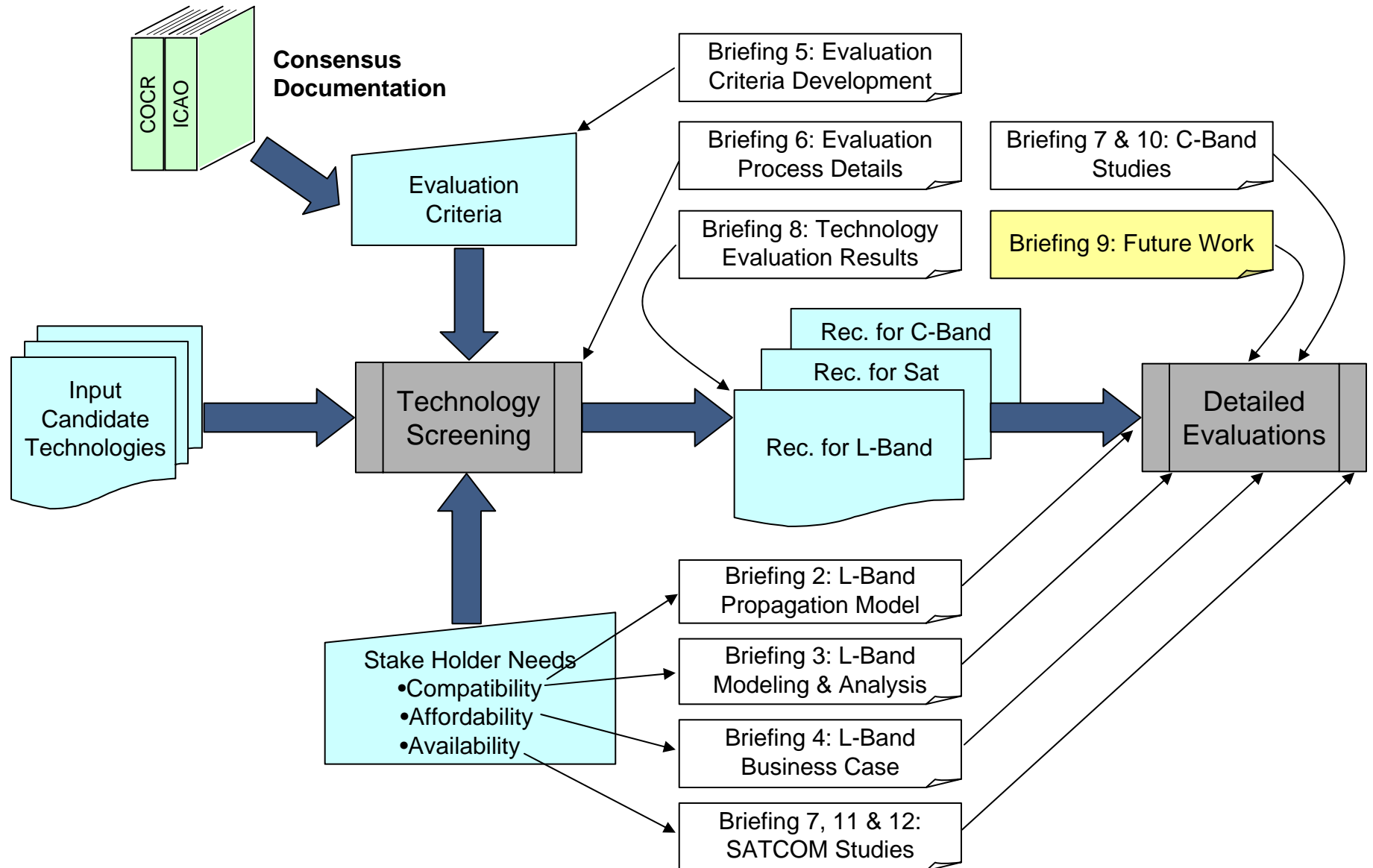
NASA Support for the Future Communications Study



Briefing #9 - Suggested Phase III Activities

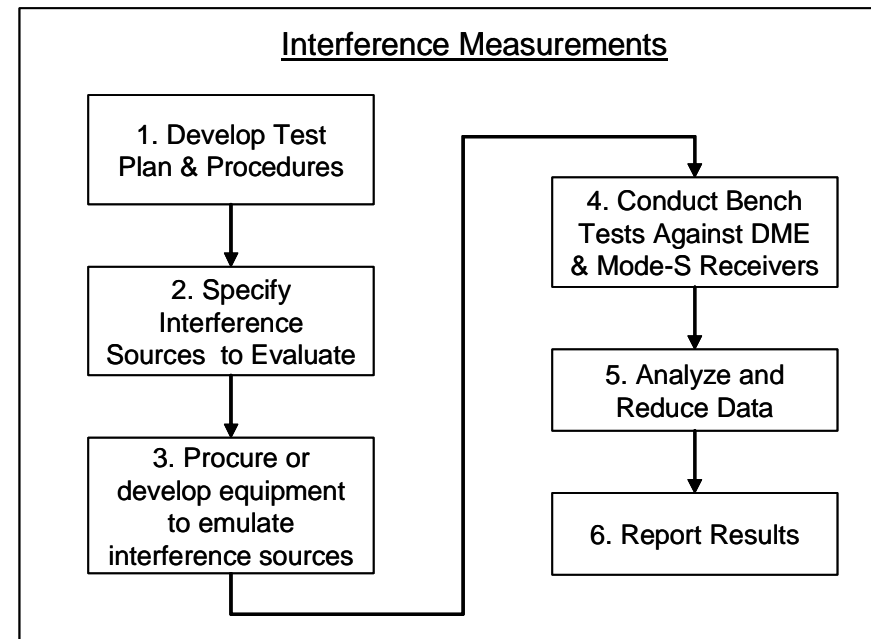
Future Communications Study
Phase II End of Task Briefing

June 21, 2006



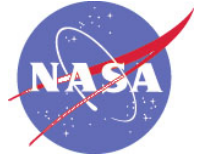
- This briefing describes proposed technology assessment activities for FCS Phase III
- These include
 - DME and Mode S Interference Measurements
 - New Detailed Technology Analyses
 - Detailed 802.16e Evaluation
 - Collection of Stakeholder Inputs and Final Technology Evaluation and Recommendations

- Objective
 - Further characterization of DME and Mode S equipment interference performance against proposed modulation types for the FCS; particularly susceptibilities from the following types of equipment
 - CDMA
 - Pulsed Communications
 - MCM
 - Narrowband Digital
- Approach
 - This activity will consist of the six interrelated tasks shown in the figure





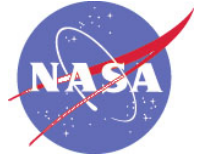
New Detailed Technology Analyses



- Objective
 - Detailed analysis of the suitability of Phase II recommended technologies as FRS solutions
 - WCDMA
 - Either B-VHF or E-TDMA
 - These are the best performing technologies that have not yet been analyzed in detail
 - The goal of this activity is to determine each of these technologies as fitting into one of the following categories as a FRS solution
 - A totally suitable existing technology for the FRS
 - A custom solution for the FRS to meet aviation needs
 - A hybrid technology solution



New Detailed Technology Analyses

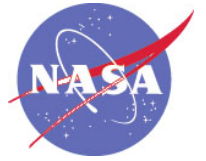


- Approach
 - Each technology will be evaluated against the FCS Phase II developed criteria, and a list of any identified deficiencies and associated recommendations for change will be developed
 - This effort will be performed in the following steps
 - Development of a detailed Concept of Use
 - Development of a Functional and Physical Architecture
 - Detailed Performance Assessment
 - Viability Assessment
 - The defined architectures will be evaluated against the following criteria
 - Functional and performance requirements of the FRS as defined in the COCR
 - Maturity, cost and other relevant factors indicative of the viability of a technical solution
 - A roadmap for standardization will be developed for technologies that appear to be particularly suitable

- Objective
 - Perform a detailed analysis of 802.16e OFDMA physical layer features that could enhance system performance in the airport surface movement area
 - These features include:
 - HARQ
 - Fast feedback channel
 - Diversity sub-carrier permutations
 - Space-time coding
 - Use of MIMO and associated handover issues
 - Convolutional turbo codes
- Approach
 - Perform MATLAB Simulink analysis and modeling as appropriate to evaluate these features
 - These techniques would be modeled and studied in the context of the Ohio University airport surface channel models



Collection of Stakeholder Inputs and Final Technology Evaluation and Recommendations



- Objective
 - Perform the final technology evaluation and develop appropriate recommendations
- Approach
 - The process for the final evaluation of the best performing technologies will combine technology performance assessment against derived criteria with synthesis of a wide range of stakeholder input/feedback to fully reflect stakeholder requirements
 - This will be facilitated through a more extensive application of AHP to accommodate perspectives of additional stakeholders and provide a more refined decision analysis